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7979 OLD GEORGETOWN ROAD SUITE 700 BETHESDA, MARYLAND 20814-2429 301-718-0111 FAX 301-215-4033

EMAIL spri-info@spri.com WEBSITE www.spri.com

May 25, 1999

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MAY 25 1999

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
Room TW-A325
445 12th Street, S.W.
Washington, D.C. 20554

Re: CC Docket 96-98

Dear Ms. Salas:

Enclosed are one original and twelve copies of the Comments of Strategic Policy Research in response *to In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996* CC Docket No. 96-98, Second Further Notice of Proposed Rulemaking (adopted April 8, 1999; released April 16, 1999).

Sincerely,

Kirsten M. Pehrsson

Kirsten M. Pehrsson

Enclosures

cc: Janice M. Myles
Jake Jennings
Claudia Fox
ITS

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

RESPONSE TO THE FCC'S SECOND FURTHER NOTICE OF PROPOSED RULEMAKING IN THE MATTER OF IMPLEMENTATION OF THE LOCAL COMPETITION PROVISIONS IN THE TELECOMMUNICATIONS ACT OF 1996

CC DOCKET NO. 96-98

Submitted by Strategic Policy Research, Inc.

MAY 25, 1999

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I. INTRODUCTION

The Commission, in response to a recent Supreme Court ruling,[1] is asking for further comments on a number of issues, among them the minimum set of network elements that are required to be offered to competitors nationwide on an unbundled basis.

In its Opinion, the Court discussed the language of Section 252(d)(2) of the Telecommunications Act of 1996, which defined so-called "necessary" and "impair" standards, as well as the "essential facilities" standard embedded in antitrust law. The Court did not further define these standards, nor indicate which should be controlling, but it did say that the Commission must make a reasonable determination of a standard on which to base its decisions as to which network elements must be made available on an unbundled basis.

It is not the intent of this pleading to define a standard. We do, however, make a compelling showing that widespread competition for a wide spectrum of local services is technically feasible and economically viable without the use of certain previously prescribed unbundled network elements ("UNEs") – specifically local switching and shared transport. Since the availability of such competition is a principal objective of the Act, we assert that if the purposes of the Act can be achieved without access to these elements, then they should not be required.

The demonstration we make is in the form of a detailed computer model (which we developed for BellSouth) of a competitor's serving network architecture that does not utilize

[1] *AT&T Corp. et al. v. Iowa Utilities Bd. et. al.*, 119 S.Ct. at 733-736 (1999).

these network elements. The model relies heavily on factual information concerning the area in which the competitor is assumed to operate – including existing UNE prices, wire center sizes and locations, current traffic volumes and revenues. It has been run for the Atlanta LATA and clearly demonstrates that, in that LATA, which is by no means atypical, competitors for local telephone service using the postulated architecture will make substantial profits serving both business and residential customers.

As will be seen from the following discussion, our showing is specifically directed to the question of whether switching and shared transport should be required as unbundled network elements. Our hypothesized use of loops and interoffice facilities obtained as UNEs serves merely as a simplifying assumption to demonstrate the feasibility of the architecture. It should not be construed to indicate that these elements must be included in the minimum set. Indeed, in markets that account for the bulk of the traffic in the U.S., there are virtually always competitive substitutes for ILEC-supplied, dedicated interoffice facilities.[2] And, as their widespread deployment amply demonstrates, there are no barriers to their deployment and further expansion. While we think a good case could thus be made for their exclusion from the set of inputs that needs to be offered, that is not the specific case we are making. Our focus is switching and shared transport.

The principal characteristics of the model and summary results are outlined below. Further details about the model and results are contained in the attached report, "Description of the TELCOMP© Model Version 1.3 and Results of its Application to the Atlanta LATA."

II. COMPETITOR' S SERVING ARCHITECTURE

The competitor's network architecture is as follows:

- The competitor is assumed to stand ready to serve all customers in a defined serving area, which may be a LATA or a subset of a LATA.

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[2]For example, in 1993, CAP facilities were already reportedly available in large cities. P. Huber, *et al., The Geodesic Network II: 1993 Report on Competition in the Telephone Industry* (Geodesic Company: Washington, DC, 1993), at 2-24 to 2-52. The FCC's most recent *Fiber Deployment Update End of Year 1997* identifies the presence of CAP/CLEC facilities across a number of U.S. cities and estimates that CAPs/CLECs have deployed collectively 1.8 million fiber miles as of 1997; at Tables 14, 15 and pp. 39-47.

- The competitor provides a wide range of local telecommunications services – at least all services that could be provided using local switch UNEs.
- The competitor leases loops, dedicated interoffice transport, and necessary collocation elements from the incumbent at published UNE prices.
- The competitor provides its own switching function at the location(s) of its choice, using equipment readily available from many manufacturers.
- The competitor receives all basic service, vertical service, intraLATA toll and interLATA access revenue.

This architecture relies only on certain dedicated UNEs – loops, dedicated interoffice transport, loop concentrators and collocation equipment. It does not require any shared UNEs, such as switching with all of its variants, or shared transport. The only equipment which the competitor *must* supply is switching – which is readily available on the market without excessive ordering intervals and which can be placed in any convenient building. Modern switches are available in a wide range of sizes, from a few thousand to over 100,000 lines, and can economically provide service in both large and small areas. No outside plant need be constructed, although some companies might find it economical and convenient to utilize their own transmission facilities or lease them from other carriers in selected locations, lowering their costs still further.

Furthermore, by providing its own switching function, the competitor has much more control over the variety of services that can be offered than if it obtained that function from the incumbent, thus furthering the objectives of the 1996 Act.

III. INPUT DATA, ASSUMPTIONS AND ECONOMIC ANALYSIS

The primary input data are certain basic facts concerning the area to be served. These include:

- The size, location, and traffic level of every incumbent local exchange carrier ("ILEC") wire center in the area to be served.
- UNE prices.

- Total revenues for basic service, vertical services, intraLATA toll and interLATA access.

Some general assumptions must be made, as follows:

- Location and cost of the competitive local exchange carrier ("CLEC") switch
- CLEC cost of capital.
- Amortization and depreciation periods for capital equipment and non-recurring costs for leased facilities.
- Anticipated service penetration – percentage of lines to be served by the CLEC at the end of the ramp-up period.
- General, Sales and Administrative ("GS&A") costs as a percentage of revenues.
- Customer acquisition costs.
- CLEC churn rate.
- Ramp-up rate.
- Synergy with interLATA toll, if any

Unlike the input data describing the customer base in the LATA, these inputs are often a single number, and can readily be varied by the user.

The model then calculates a set of economic indicia, including:

- Profit and loss for each year of the ramp-up.
- Cash flow for each year and cumulative capital required.
- Return on investment over the ramp-up period.

IV. MODEL RESULTS

The model has been run for the Atlanta LATA. It shows that, using actual revenues and current UNE prices, (and a reasonable and conservative set of other assumptions), a competitor can earn excellent returns with modest investments while standing ready to serve all potential customers in the LATA. The returns vary, depending upon whether the competitor selectively targets high revenue customers, and whether it benefits from synergies with interLATA service. In all cases, however, the business is highly profitable.

Specifically, the returns on investment vary from a low of 42 percent to a high of 153 percent. Profits are always positive by the second year, and all capital is recovered by the fifth year in all cases. This is clearly a good business by any measure, and it is all done without the use of unbundled switching and shared transport network elements.

V. IMPLICATIONS OF THIS RESULT

The principal implication of this result, for the questions at issue in this proceeding, is that the FCC should not include switching and shared transport within the "minimum" set of UNEs. Atlanta is not atypical as LATAs go. It contains a large metropolitan area, a suburban ring and outlying rural areas. The UNE prices are in the midrange of those in effect for Bell companies around the nation[3], and local telephone revenues are at the upper end of the range.[4] If competition can succeed without shared UNEs in Atlanta, it can almost certainly succeed in many other areas as well. If conditions in some LATAs are so different that these conclusions do not appear to apply, then specific studies should be instituted in those locations. As the Commission has noted in its rules, state regulatory agencies can mandate access to additional network elements if appropriate for local conditions. However, since loop prices are the principal determinant of direct costs, a region that could not support competition using this architecture probably could not support it even if switch UNEs were offered.

Only the switching (and related shared transport) UNEs are discussed here. It should not be inferred from this discussion that the unbundled network elements that were used in this analysis, such as loops and dedicated interoffice transmission, are necessarily required to sustain local competition. There are many areas of the country, including downtown Atlanta,

[3]Data collected by SPR in August 1998 showed that UNE prices for unbundled loops (the most significant cost element in this architecture) ranged from a low of less that $4.00 in certain metropolitan areas to well over $50 in rural areas. Most rates were clustered in the $10.00 to $20.00 range. BellSouth Georgia's rate for unbundled loops is $16.50. *See* Order Establishing Cost-Based Rates, Docket No. 7061-U, In re: Review of Cost Studies, Methodologies and Cost-Based Rated for Interconnection and Unbundling of BellSouth Telecommunications Services, October 21, 1997, before the Georgia Public Service Commission, at Appendix A.

[4]1997 FCC data from the Bell operating companies show monthly switched revenues per access line ranging from $28.17 to $47.72. SBC, USWest and BellSouth did not show individual state data, so it is likely that at least some of the states in these regions have revenues higher than those listed FCC, *Statistics of Common Carriers,* at Table 2.9 at 2.10 (1997-1998 Edition). The BellSouth Georgia data used in our study showed revenue per access line of $47.22.

where such facilities are available from other parties than the ILEC at fully competitive prices. In such situations, these facilities can be used in lieu of dedicated transmission UNEs, making it inappropriate to include these elements within the "minimum set."

Switching, however, is of central importance to the entire process of providing competitive local service, since it is the element where narrowband services are defined. (Broadband services are a different matter, and cannot be supported by local switch UNEs in any event.) As shown here, CLECs can profitably provide a full spectrum of local service using their own switching. Switch UNEs are not needed for this purpose. Their primary function is to allow a CLEC to replicate local service while incurring costs which are far below resale prices without providing any added value. Allowing CLECs to conduct arbitrage operations of this sort is certainly not an objective of the Act, nor is it likely to provide the public with meaningful service choices.

VI. RELATIONSHIP TO LEGISLATIVE CRITERIA

The Act states that the Commission shall consider, at minimum, whether

(a) Access to such network elements as are proprietary in nature is necessary, and
(b) Failure to provide will impair the ability of the telecommunications carrier seeking access to provide the services that it seeks to offer. [5]

There is much discussion of these matters in the Notice, as well as of the related "essential facilities" concept. It is not the purpose here to argue the meaning of, or the applicability of, these legislative criteria and related questions. Suffice it to say that the studies reported here do show that:

(1) Access to shared network elements such as switching and shared transport is not necessary to enable competition.

(2) The failure to provide such shared network elements certainly does not impair the ability of the competitor to provide a broad spectrum of local services. To the contrary,

[5]Telecommunications Act of 1996 at 252(d)(2).

the competitor is better able to provide such services than if it used these elements, since by controlling the switching element it is in a far better position to innovate.

(3) These network elements are certainly not "essential facilities" as these are normally understood under antitrust law.

Therefore, no matter what standard is ultimately adopted, switching and shared transport should not be among the minimum set of network elements which must be made available on an unbundled basis.

VII. SUMMARY

The tests described in this filing have conclusively demonstrated that competition for local telephone service is technically feasible and economically viable without the use of switching or shared transmission UNEs in the Atlanta LATA, and probably in many other LATAs as well. Switching equipment can easily be self-provided, since it is readily available from many manufacturers, and can be installed in a location or locations of the CLEC's choice. Since one switch is adequate to serve large number of customers, and others can be added as traffic grows, initial capital requirements are not onerous.

Any CLEC selecting this architecture has the potential to earn substantial profits and obtain an early return of capital, while providing a service which can readily be enhanced according to the needs of its customers. Switching UNEs are by no means necessary, their absence clearly does not impair the CLEC's ability to provide service, and they are not an essential facility.

The Commission should not include switching and shared transport elements within the minimum set of UNEs. If a CLEC insists that these UNEs are necessary in some LATA, then it should be obliged to make a showing to that effect. Such a showing is most appropriate before a state regulatory body, as the Commission itself has prescribed in its rules.

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7979 OLD GEORGETOWN ROAD SUITE 700 BETHESDA, MARYLAND 20814 (301) 718-0111 (301) 215-4033 FAX

EMAIL spri-info@spri.com

Description of the TELCOMP© Model Version 1.3, and Results of its Application to the Atlanta LATA

March 29, 1999

I. Overview

The TELCOMP© Model calculates the costs and revenues that a competitive local exchange carrier ("CLEC") would experience if it provided local service utilizing unbundled network elements ("UNEs") for loop distribution and interoffice transmission, but provided its own switching equipment. The core of the model relies on clear and unambiguous data, such as locations and sizes of wire centers, existing traffic volumes, current revenues per line, and UNE prices. The model is also intended to yield conservatively high costs, precisely to dispel concerns that it may be overly optimistic about the economics of intraLATA competition. All of the direct costs incurred by a CLEC — payments to the incumbent local exchange carrier ("ILEC") for network elements and capital costs for owned equipment — are included. Both recurring and nonrecurring costs are calculated, with the latter being spread over the life of the installation in a manner similar to the treatment of capital costs. Revenues associated with the services supported by the modeled network are also calculated. Operations, marketing and other support costs are not specifically modeled, but are estimated as a percentage of revenue. The model can also accommodate as inputs costs associated with starting the business and customer acquisition costs.

Various marketing strategies can be analyzed, including targeting all customers in the LATA, all customers served by selected wire centers, or focusing service offerings to attract a larger proportion of high-revenue customers.

The model also includes variables to take account of possible synergies between the CLEC business and the interexchange business. These synergies apply to both marketing and production. Because of these synergies, the CLEC business may be more attractive for inter-exchange carriers ("IXCs") than for other entrants.

II. Model Structure and Key Assumptions

The specific system architecture is shown in Figures 1 and 2. Figure 1 details the network layout, showing what kinds of facilities are used to provide the various required service elements. Figure 2 is a detailed diagram of the wire center configuration at each ILEC central office ("CO"), including the specific network elements that need to be obtained by the CLEC, and the equipment that needs to be placed in collocation space. The primary structural assumptions are as follows:

1) The CLEC will provide service everywhere in the LATA or some specified subset of it. It will stand ready to serve all customers in the defined areas, but may achieve different penetrations for different customer groups (grouped by business/residence and revenue stratum) depending upon its service offerings and pricing.
2) The CLEC will always use unbundled loops to reach its customers. It then necessarily collocates at the serving wire center. It also obtains a loop concentrator located at the serving wire center as an unbundled network element.
3) The CLEC uses DS-1 lines as UNEs to connect the serving wire center with its own serving switch. This is a high-cost assumption, since there may be cases where the CLEC could reduce costs by providing its own facilities or obtaining them from facilities-based CLECs, which may cost less than facilities obtained from the ILEC at UNE rates.
4) The CLEC will provide its own switches.
5) The CLEC will interconnect its own switches, if it has more than one, using leased DS-1 facilities obtained as UNEs. As is the case in item 3) above, this is a high cost assumption. There may well be a more cost-effective ways for a CLEC to obtain these facilities. In the analyses run to date, however, the switch cost function used has led to a single switch configuration in all cases, so there have been no costs in this category.

6) The CLEC will provide trunks, again using leased DS-1 facilities, to deliver traffic terminating at the ILEC to the ILEC's terminating wire center.
7) Similarly, calls originating at an ILEC switch and terminating on a CLEC switch will be delivered to the CLEC at the originating wire center.

Figure 1

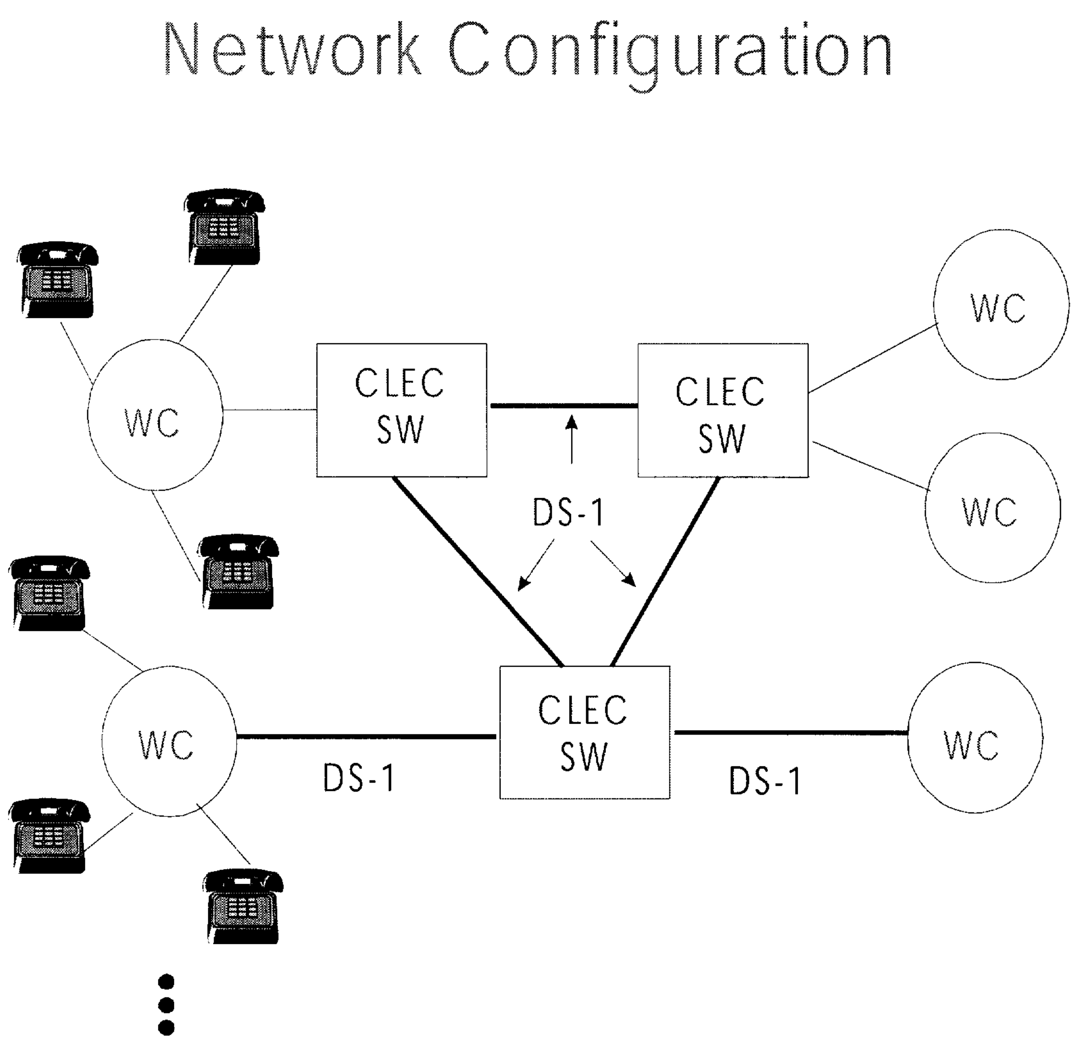
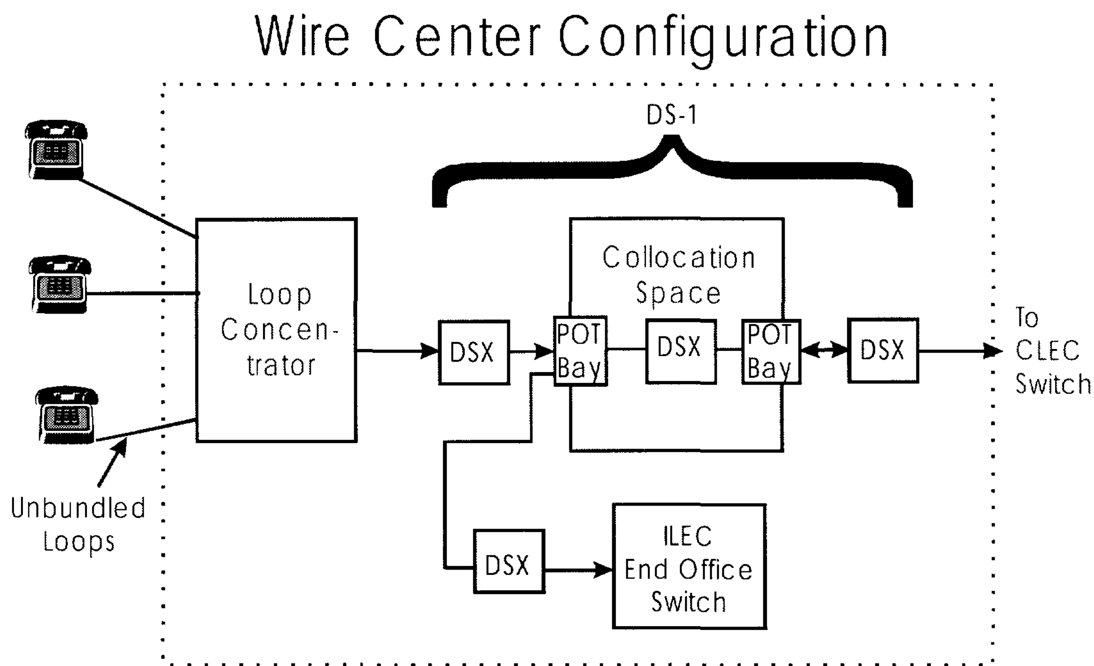


Figure 2



Note: Figure 2 shows two POT bays for clarity of exposition. There is actually only one POT bay in each collocated space, but each line that enters the collocated space transits the POT bay twice.

8) If the CLEC is an interexchange carrier, it may provide interexchange service in conjunction with its local service. In this case, it will incur additional expenses and reap additional revenues to the extent that new interexchange customers are attracted.

III. Cost Calculations

Using the above network structure and appropriate input data, the model calculates the following:

1) *The costs of connecting the customers' premises to the ILEC central office.*

This is simply the cost of an unbundled loop, containing both a non-recurring and recurring component.

2) *The costs of a loop concentrator.*

The loop concentrator is a device that multiplexes individual lines into DS-1 bit streams and also provides for line concentration of as much as two to one. In particular, the loop concentrators offered by BellSouth will accept as many as 96 lines and concentrate them onto two DS-1 lines. In our current model runs, because there may be areas where the traffic is too heavy to permit the two-to-one concentration, we have conservatively assumed that 80 loops are multiplexed onto the two DS-1 channels. The costs that are incurred are the cost of the loop concentrator itself, which contains both a recurring and nonrecurring component, plus a per-line charge for each loop connected to the loop concentrator, denoted as a "CO Channel Interface."

3) *The costs of collocation at the wire center.*

This is a complex area, and may vary among ILECs. The structure assumed here follows the BellSouth method of collocating. Examining the wire center configuration in Figure 2, it can be seen that the loop and the loop concentrator are interconnected by the ILEC outside of the collocated space. The DS-1s that emerge from the loop concentrators transit a DSX frame to cross-connect to the collocated space. A point of termination ("POT") bay serves as the interface between the ILEC network and the collocated space. The only equipment that the CLEC need purchase is a DSX frame to connect the DS-1s coming from the loop concentrator to the outgoing DS-1 line which ultimately connects to the CLEC switch. This connection to the outgoing line again transits the POT bay and a DSX frame. (Figure 2 shows two separate POT bays for clarity of exposition. In actuality, there is just one POT bay for each collocated space, which the connections described here transit twice.) There is a small charge for each transit of a POT bay or a DSX frame. The situation is similar for trunks connecting the CLEC switch with the ILEC switch in the building. These trunks are designed to carry traffic in both directions between the ILEC and the CLEC.

It should be noted that this architecture precludes the need for the CLEC to dispatch to the collocated space unless the CLEC elects not to pre-wire and pre-inventory its collocated equipment. All additions, rearrangements and trouble isolation at the DS-0 level are done by the ILEC, since the CLEC does not have access to the individual DS-0 channels at this location. It is also assumed, since the DSX frame is virtually a passive device, that the collocation space is "cageless" which eliminates the need for a minimum square footage charge. The charges for collocation, in addition to the DSX cross-connects and POT bays mentioned above, comprise a one-time "application fee" and square footage costs. There are also charges for power, but since the DSX is virtually passive, these are negligible in this case.

The amount of space is calculated based on the number of DSX frames. A DSX frame, or bay, contains up to ten panels, each of which can accommodate ten DS-1 lines. Thus, the number of DSX bays in a central office can be calculated from the number of DS-1 lines that transit the collocated space. Each DSX frame requires approximately 7.5 square feet of space, which includes enough space to work on the unit.

4) *The costs of connecting the wire center to the CLEC switch.*

These costs are calculated based on the UNE prices for dedicated interoffice facilities. UNE prices include a fixed charge per DS-1 and a mileage charge. For all central offices other than the serving wire centers of CLEC switches, there is also a local channel charge, which is not mileage-dependent.

5) *The costs to the CLEC of providing the switch to serve its customers.*

Since the CLEC is providing its own switch, the cost of switching is a capital cost. The cost of a switch is described by a formula of the form $A+Bx+Cy$, where A, B and C are parameters, x is the number of unconcentrated lines, and y is the number of trunk terminations. The maximum number of lines plus trunks is given by a parameter, M. The default values are $900,000 plus $75 per line and $75 per trunk. The trunk and line costs are assumed to be the same because many of the "line card" functions actually take place at the loop concentrator. The maximum size is assumed to be 100,000 lines plus trunks.

6) *The costs of interconnecting the CLEC switches, if there is more than one.*

It is assumed that the switches are fully interconnected with trunk groups engineered for 1-percent blocking in the busy hour and carried on DS-1 facilities obtained from the ILEC at UNE rates. We assume that every call is carried (if necessary) to the POP nearest to the terminating CO. Costs include an interoffice facility and two local channels for each channel between POPs. However, since the cost model used for switching in this version of the model assumes a substantial getting-started cost and a large maximum size, a single switch configuration is always optimal for the CLEC at the penetration levels examined (5 percent).

7) *The costs of carrying traffic between the ILEC and the CLEC.*

This is the cost of the trunks that carry traffic from the CLEC switch to the ILEC terminating wire center, and from the originating ILEC switch to the CLEC switch. In order to avoid common transport and switching charges, it is assumed that the CLEC provides trunks, leased at UNE rates, from its switch to the ILEC switch where the call is to terminate. Similarly, in order to avoid requiring the ILEC to carry local traffic to a possibly distant CLEC switch, it is assumed that originating ILEC traffic is handed off to the CLEC at the originating wire center and utilizes these same trunk groups. These trunks are also engineered for 1-percent blocking in the busy hour. As in the case of the facilities connecting the loops to the CLEC switch, these trunks will incur interoffice dedicated transport and local channel charges as appropriate. Although these facilities connect the same locations as the lines between the customers and the CLEC switch, they do not share the same DS-1 lines.

We assume that the traffic volume to and from the ILEC is equal. Under most interconnection agreements, the charges for call completion at the terminating switch are equal. Thus, net charges for call completion is zero. In practice, CLECs can (and do) improve their results by targeting customers with a high proportion of terminating traffic, such as Internet Service Providers. We do not, however, consider this.

8) *Total network cost of providing service.*

The sum of the above, including depreciation of capital expenditures, amortization of non-recurring charges, and interest payments for both, is the total direct cost of providing local exchange service, exclusive of administration, billing, and marketing costs.

9) *Other costs:*

A number of non-network costs are considered, so that a realistic estimate of the total profitability of the business can be obtained. These are:

a. "Business getting started cost." This represents those costs, other than network costs, which must be incurred to initiate the business. This is given as a single quantity, and is expended in the first year of operation. The default value is $500,000.

b. "Customer acquisition cost." This represents the marketing effort, whether by direct marketing or mass marketing, that is expended to capture a customer. It is a one-time cost per line, expended at the time of service commencement for that customer. The default value is $25 per line. This amount is *in addition to* any installation charges that the CLEC charges its customers. It should be noted that customer "churn," that is, disconnects of old customers and connections of new ones, will lead to customer acquisition costs, as well as installation costs. Thus, if the amortization life of a loop (in the default case), is 2.5 years, then the customer acquisition and unbundled loop non-recurring costs are increased to account for 40 percent"churn."

c. "Sales, General and Administrative ("SG&A")." This is expressed as a percentage of gross revenue, and includes any discounts or sales incentives (other than the customer-acquisition costs described above) adopted to attract new customers. The default value is 25 percent of revenue.

10) *The revenues to be realized by the CLEC.*

This includes all local, intraLATA toll, and vertical service revenues as well as interLATA access charges. It does not include private lines, terminal equipment, inside wire, or any other revenue which depends on equipment or facilities which are not included in the cost model. It also does not include installation revenues, which are treated as an offset to customer-acquisition costs.

11) *Additional revenues and costs associated with interexchange operations.*

Interexchange revenues are assumed to supplement the CLEC's local revenues. The costs of interexchange operations are estimated based on financial data from AT&T and MCI. Allowance is made for the high marketing and overhead costs of the interexchange business.

12) *Cash flow for each year of the ramp-up period.*
13) *Profit (or loss) for each year of the ramp-up period.*
14) *Rate of return over the study period.*

The input data required for TELCOMP© are listed in Attachment 1. The cost model is implemented in the computer language Mathematica™, and can be downloaded, along with descriptive material and a user's guide, from the SPR website, at www.spri.com.

IV. Results

The model was run for the entire Atlanta LATA, using BellSouth UNE and collocation prices. Tables 1 through 5 are the input and results portions of the program as it appears on the website. The input data and assumptions are given in Tables 1 and 2. The section of Table 1 labeled "Prices of Unbundled Elements" contains the critical cost information normally contained in the ILEC UNE price list, and the numbers are the prices for Georgia. Similarly, the revenue information in the "Customer Input" section of Table 2 is actual data from Georgia. The rest of the inputs are parameters that can be selected by the user to test the implications of various operating assumptions.

Table 1

INPUT DATA I

The TELCOMP© Model v1.3 (rel. 26 Mar 1999)

LATA: Atlanta GA; POP locations: MCI Worldcom

Model Input Values

	Target Markets
10	number of residential deciles targeted by CLEC
10	number of business deciles targeted by CLEC
	Prices of Unbundled Elements
262	price of a loop multiplexer ($/mo)
16.51	price of an unbundled loop ($/mo)
0.9016	price of a loop crossconnect ($/mo)
308.13	non-recurring price of the first loop multiplexer at CO ($)
76.33	non-recurring price of an additional loop multiplexer ($)
42.54	non-recurring price of the first loop at CO ($)
31.33	non-recurring price of additional loops at CO ($)
38.36	price of a DS1 local channel ($/mo)
0.45231	price per mile of a DS1 interoffice channel ($/mile/mo)
78.47	price of a DS1 interoffice channel termination ($/mo)
16	price of two DS1 collocation crossconnects ($/mo)
2.4	price of two DS1 collocation POT bay connections ($/mo)
312.89	non-recurring price of a DS1 local channel ($)
111.75	non-recurring price of interoffice DS1 facility termination ($)
3850	application fee for collocation at each CO ($)
310	non-recurring price of first pair of DS1 cross-connects for collocation ($)
54	non-recurring price of additional pairs of DS1 cross-connects for collocation ($)
7.5	price of collocation space ($/sq ft/mo)
100	price of collocation space preparation ($)
20000	price of DS1 cross-connect (DSX) bay ($)
0	price of number portability ($/mo/line)
	Model Parameters
0.01	blocking probability
80	loops per loop multiplexer
7.5	square feet per DSX bay
900000	fixed cost of switch ($)
75	switching cost per line ($)
75	switching cost per trunk ($)
100000	maximum switch size (lines + trunks)
0.0033	monthly maintenance expense / gross investment
0.0119	monthly depreciation expense / net plant
0.0333	monthly amortization rate for non-recurring loop costs
0.0119	monthly amortization rate for other non-recurring costs
25	customer acquisition expenditures net of installation charges ($/line added)
500000	start-up expenditures ($)
0.25	other sales costs (including price discounts) and G&A costs / revenues

Table 2

INPUT DATA II

InterLATA Toll Assumptions

0	Does CLEC provide interLATA toll? (1 if Yes, 0 if No)
0.14	price of interLATA toll ($/min)
0.027	price of access ($/min)
0.6	fraction of interLATA toll revenues going to CLEC
0.021	marginal non-capital cost of interLATA toll ($/min)
0.1	marginal capital expenditure of interLATA toll ($/min)
1.8	access minutes per conversation minute

Customer Inputs

CLEC Penetration by Year

0.0056	year 1
0.0167	year 2
0.0278	year 3
0.0389	year 4
0.05	year 5
144908389	total ILEC revenue in area served by CLEC ($/yr)

Georgia Revenues by Customer Decile ($/yr)

res total	res access	bus total	bus access
16174310	8112213	10759780	3429897
12111822	4396874	8306875	1314614
10671772	3204553	7766511	995237
9785495	2495319	7465744	819394
9068810	1871477	7064682	571568
8452885	1351130	6704675	486527
7894335	902803	6172902	324532
7424501	530548	5741597	201090
7073853	246349	5149529	90551
6688134	51992	4793337	8351

2328020	residential loops in Georgia
1078250	business loops in Georgia

The results are given in Tables 3 through 5. Most of the parameters are the same in the three cases. All use the basic Georgia cost and revenue information, assume a five-year ramp-up period, 5 percent penetration of targeted markets, and the other input parameters shown in Tables 1 and 2. The only difference is in the business strategy.

Table 3 is the base case. It assumes that all business and residential customers in the LATA are targeted equally, and no benefits from additional inerLATA traffic are obtained. Even in this, which is the least favorable case examined, the business is quickly profitable. It shows positive profits in the second year, positive cash flow in the third year, and full recovery of all investments by the fifth year. The overall rate of return for the business is 42 percent.

Table 3

Results - All Customers Served, Long Distance Not Included

Results by Year

	Year 1	Year 2	Year 3	Year 4	Year 5
lines in service	17,050	51,151	85,254	119,351	153,459
lines added	17,050	40,921	54,563	68,199	81,848
SG&A: customer acquisition expenditures	$426,250	$1,023,025	$1,364,085	$1,704,965	$2,046,210
SG&A: start-up expenditures	$500,000	$0	$0	$0	$0
SG&A: other expenses/line/month	$11.80	$11.80	$11.80	$11.80	$11.80
total network expenses/line/month	$36.08	$31.09	$30.25	$29.72	$29.40
total capital expenditures/line/year	$427.44	$120.89	$93.52	$67.00	$57.92
total depreciation, amortization & maintenance/line/month	$7.37	$4.69	$4.27	$3.93	$3.73
total revenue/line/month	$47.22	$47.22	$47.22	$47.22	$47.22
total capital expenditures peryear	$7,287,907	$6,183,786	$7,973,000	$7,996,550	$8,887,885
total capital expenditures per line added peryear	$427	$151	$146	$117	$109
total revenue peryear	$9,660,317	$28,981,517	$48,303,851	$67,622,785	$86,947,951
total expenses peryear	$9,797,902	$26,330,941	$43,020,474	$59,472,866	$75,870,894
profit per year	($137,585)	$2,650,576	$5,283,377	$8,149,918	$11,077,057
cash flow per year	($6,277,852)	($1,477,447)	$351,430	$3,993,563	$6,793,039
cumulative cash flow	($6,277,852)	($7,755,298)	($7,403,868)	($3,410,305)	$3,382,734

rate of return	**41.59%**

Parameters

number of POPs	1
residential users	10 deciles
business users	10 deciles
central offices (COs) included	108
objective penetration rate after 5years	5%
ramp-up period	5years
long distance included (1 if Yes, 0 if No)	0

Table 4 represents a more likely business strategy, in which the CLEC targets all business and the highest-revenue 30 percent of residential customers. Predictably, this improves results significantly. In this case, both profits and cash flow turn positive in the second year, and all investment is returned by the third. The overall rate of return increases to 87 percent. It is significant to note that, although the total revenues in this case are less than in the base case, the total profits are greater. This implies that the CLEC would not merely have a lower return, but would actually lose money on the additional residential customers it serves in the base case.

Table 4

Results - Selected Customers Served, Long Distance Not Included

Results by Year

	Year 1	Year 2	Year 3	Year 4	Year 5
lines in service	9,323	27,967	46,615	65,264	83,910
lines added	9,323	22,373	29,835	37,295	44,752
SG&A: customer acquisition expenditures	$233,075	$559,330	$745,870	$932,375	$1,118,790
SG&A: start-up expenditures	$500,000	$0	$0	$0	$0
SG&A: other expenses/line/month	$14.91	$14.91	$14.91	$14.91	$14.91
total network expenses/line/month	$43.29	$34.05	$32.13	$31.27	$30.96
total capital expenditures/line/year	$655.99	$129.91	$87.85	$69.59	$70.78
total depreciation, amortization & maintenance/line/month	$10.64	$5.77	$4.74	$4.27	$4.15
total revenue/line/month	$59.64	$59.64	$59.64	$59.64	$59.64
total capital expenditures peryear	$6,115,773	$3,633,262	$4,095,280	$4,541,499	$5,938,877
total capital expenditures per line added peyear	$656	$162	$137	$122	$133
total revenue peryear	$6,672,100	$20,014,867	$33,360,498	$46,706,844	$60,051,048
total expenses peryear	$6,511,548	$16,431,617	$26,311,681	$36,165,822	$46,186,365
profit per year	$160,552	$3,583,251	$7,048,816	$10,541,022	$13,864,678
cash flow per year	($5,025,806)	$1,363,803	$4,821,943	$8,294,691	$10,759,731
cumulative cash flow	($5,025,806)	($3,662,003)	$1,159,940	$9,454,631	$20,214,363

rate of return	**86.82%**

Parameters

number of POPs	1
residential users	3 deciles
business users	10 deciles
central offices (COs) included	108
objective penetration rate after 5years	5%
ramp-up period	5years
long distance included (1 if Yes, 0 if No)	0

Table 5 shows the best case. In this strategy, best suited for an IXC, not only are the markets stratified as in the case above, but it is assumed that the CLEC obtains interLATA business from some of the customers for whom it provides local service. It is likely that if the CLEC is also an IXC, virtually all of the customers using that CLEC would also use it for interLATA service. Some of these CLEC customers, however, might already have been customers of the IXC before it offered local service, and their business cannot be counted as incremental to the provision of local service. In the case tested, this fraction of customers that switch to the CLEC for interLATA traffic is assumed to be 60 percent. This leads to even more favorable results. The business is profitable in the first year, cash flow is positive in the second, and all investment is returned by the third. The overall rate of return on investment for the five year period is 153 percent.

Table 5

Results - Selected Customers Served, Long Distance Included

Results by Year

	Year 1	Year 2	Year 3	Year 4	Year 5
lines in service	9,323	27,967	46,615	65,264	83,910
lines added	9,323	22,373	29,835	37,295	44,752
SG&A: customer acquisition expenditures	$233,075	$559,330	$745,870	$932,375	$1,118,790
SG&A: start-up expenditures	$500,000	$0	$0	$0	$0
SG&A: other expenses/line/month	$18.61	$18.61	$18.61	$18.61	$18.61
total network expenses/line/month	$46.94	$37.69	$35.75	$34.89	$34.56
total capital expenditures/lineyear	$672.19	$140.71	$94.33	$74.22	$74.38
total depreciation, amortization & maintenance/line/month	$10.88	$6.01	$4.97	$4.48	$4.35
total revenue/line/month	$74.44	$74.44	$74.44	$74.44	$74.44
total capital expenditures peryear	$6,266,794	$3,935,272	$4,397,354	$4,843,590	$6,240,919
total capital expenditures per line added peryear	$672	$176	$147	$130	$139
total revenue peryear	$8,328,498	$24,983,708	$41,642,492	$58,302,169	$74,959,165
total expenses peryear	$7,333,836	$18,895,222	$30,411,234	$41,896,503	$53,543,704
profit peryear	$994,663	$6,088,486	$11,231,258	$16,405,665	$21,415,462
cash flow per year	($4,321,142)	$3,628,665	$8,798,295	$13,982,672	$18,159,132
cumulative cash flow	($4,321,142)	($692,476)	$8,105,819	$22,088,491	$40,247,623

rate of return	**153.06%**

Parameters

number of POPs	1
residential users	3 deciles
business users	10 deciles
central offices (COs) included	108
objective penetration rate after 5years	5%
ramp-up period	5years
long distance included (1 if Yes, 0 if No)	1

All of the scenarios reported here were based on a five-year ramp-up period. Although this seems like a reasonable rate, it is possible that some carriers may wish to develop their market more rapidly. Such a course is not likely to change the bottom line very much, although it will, of course, require a more rapid infusion of capital. Indeed, a previous, simpler model which merely took a "snapshot" of the situation at full deployment, which did not consider non-recurring costs or long distance, and which assumed a rate of $2.50 per line per month to cover all collocation costs, generated recurring costs for the non-LD cases which are virtually identical to those reported here at full deployment.[1] We may thus conclude that line-related costs such as the unbundled loop, the loop concentrator, the related DS-1s and the switch, along with the revenues per line, dominate the calculations. More precision in other parameters will not alter the basic conclusions.

It seems clear from the above analyses that the availability of UNEs at the listed prices provides ample opportunity for a prospective CLEC to enter the local exchange business in the Atlanta LATA. However, it may be useful to make a few observations about some implications of the model and other issues that could affect the practical ability of a CLEC to enter the market.

First of all, we have selected the objective penetration — approximately 5 percent — on the basis that anything smaller would not be meaningful in demonstrating the possibility of effective competition, while anything larger would yield an even more favorable result. It was also felt that a true competitive presence would be best demonstrated if the CLEC operated in the entire LATA, which comprises 108 wire centers. Previous experiments had shown that restriction to a subset of wire centers would not, in any event, materially affect the results.

Similarly, it was anticipated that competition would certainly be said to exist if the CLEC served all segments of the population equally. Hence the "10, 10" scenario. Recognizing that this is an unlikely business strategy, however, a case was examined assuming targeted marketing plans which would be more attractive to certain demographic groups, measured by revenue — the "10, 3" scenario.

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[1] *Implementing Section 271; Private Gain vs. Public Harm,* prepared by SPR on behalf of BellSouth Telecommunications, August 18, 1998.

Nonrecurring costs have been calculated and amortized so they can be accounted for as a cost of doing business, and provide part of the costs to be offset against the revenue. They are also considered as part of the cash flow analysis.

Support costs, including marketing, billing, customer service and the like, can vary enormously, depending upon whether the entrant is a company such as AT&T, which already has a substantial presence in the local market, and people, facilities and billing systems in place; or whether it is a company that must start from scratch. Furthermore, all the parties that have specific knowledge of these costs have great incentives to overstate or understate them. Hence, such costs are subject to intense debate. They cannot be firmly estimated, so we have developed results assuming: that the so-called SG&A expenses are equal to 25 percent of revenues, a ratio which is typical of communications carriers; that there is a certain "getting started cost" for the business; and that there is an acquisition cost per customer.

There has been much discussion during the course of the various "271" proceedings about the adequacy of the ILECs' operations support systems ("OSS"). This problem is mitigated, but not eliminated, by the serving architecture selected for the model. The only BellSouth OSS system which is needed to support this architecture is the provisioning system. Several different types of connections must be provisioned, as follows:

- Collocation and DS-1 lines.

  The collocation space is provided only once in each wire center, and subsequent operations are only required when DS-1 lines are added. Normal ordering and inventory procedures (*e.g.*, the CLEC will generally order several DS-1s at a time to cover its forecasted needs for some future interval) should keep the number of provisioning events to a minimum for DS-1 lines and associated cross-connects.

- Individual customer lines using unbundled loops.

  This is the area where there is the most concern about the adequacy of BellSouth's systems. However, the scenario represented by the TELCOMP model evidences a level of activity which is so small compared with BellSouth's ordinary connect and disconnect activity that it strains credibility to question BellSouth's ability to meet the demands.

Significantly, since no shared network elements, such as switching elements or common transport, are required, the provisioning and billing systems currently in use can, with modest modification, be used to support CLEC operations. If shared elements were included, they would require provisions for measuring and billing items which are not normally measured and billed, a far more cumbersome process than dealing with discrete network elements such as loops and DS-1 lines.

Finally, as mentioned above, the CLEC has ample opportunity to reduce costs still further through selective deployment of its own facilities. In addition, there is an opportunity in the serving scenarios we have outlined here for the CLEC to offer advanced services (which are largely switch-based) and capture the corresponding revenues.

V. Conclusions

We conclude from this analysis that, under the existing arrangements for interconnection and leasing of UNEs, a large CLEC, particularly an interexchange carrier, can profitably provide local service in the Atlanta LATA in any of a number of ways. It can make a profit by serving all customers equally, a greater profit by targeting its offerings to high-revenue customers, and even greater profits by integrating local service with interexchange service.

Attachment 1

Data Required for TELCOMP© Model

A. For each wire center:

1. Name (CLLI Code or other);
2. V&H Coordinates (location);
3. Number of business lines in service;
4. Number of residential lines in service;
5. Originating intraLATA and local minutes of use ("MOU"); and
6. Originating IntraLATA busy hour traffic volumes in erlangs (to be inferred from monthly MOU by dividing by 12,000);

B. For the region as a whole:

1. V&H Coordinates of CLEC POPs (MCI Worldcom POP location as default);
2. Unbundled loop prices (in some jurisdictions this may vary by wire center, but Georgia has a single rate);
3. Interoffice DS-1 UNE rates;
4. DS-1 local channel UNE prices;
5. Loop concentrator UNE prices;
6. Collocation charges;
7. Interconnection prices;
8. Number portability prices;
9. Total business revenue, including local service, local usage, intraLATA toll, SLC, vertical services and interLATA access;
10. Total residence revenue, including local service, local usage, intraLATA toll, SLC, vertical services and interLATA access; and
11. Distribution of business and residence revenues by customer.

C. Assumptions about competitor's network and services:

1. Fraction of lines served by CLEC (penetration of target market);
2. Target markets selected, by revenue group (*e.g.*, all business, top 30 percent residential);
3. Capital cost for switching equipment;
4. Capital cost of DSX frames;
5. Cost of capital;
6. Depreciation lives for switching and other capital equipment;
7. Switch maintenance factor;
8. Amortization rate for non-recurring loops costs;
9. Amortization rate for other non-recurring costs;
10. Loading factors for billing, marketing, *etc.*;
11. Ramp-up period;
12. G & A costs as a fraction of revenues;
13. "Business getting started" cost;
14. Acquisition cost per customer;
15. Churn rate;
16. Additional interexchange customers served;
17. Additional interexchange revenue; and
18. Additional interexchange costs.